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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/841,282	04/24/2001	Noritaka Mochizuki	1232-4709	6033

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EXAMINER
THOMPSON, TIMOTHY J

ART UNIT	PAPER NUMBER
2873	

DATE MAILED: 09/14/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/841,282	MOCHIZUKI, NORITAKA	
	Examiner	Art Unit	
	Timothy J Thompson	2873	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,2,4-7,10-12,15,16 and 18-35* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,2,4-7,10-12,15,16,18-24 and 26-35* is/are rejected.

7)☒ Claim(s) *25* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *24 April 2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *01/27/2003*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 33 rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 33 states; an interval between the adjacent piezoelectric elements **is minimized as much as possible.** Minimizing the piezoelectric element as much as possible is a limitation that cannot be quantified.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 2, 4, 6, 10, 11, 15, 18, 26-31, 34,35 are rejected under 35 U.S.C. 102(b) as being anticipated by Helsel et al.(U.S. Patent No. 6,285,489).

Regarding claim 1, Helsel et al. discloses An optical modulation element capable of forming a reflective diffraction grating in width heights of a plurality of elements each having a reflecting surface periodically change(fig 38A, col 12, lines 60-65), wherein the reflecting surface of at least one of the plurality of elements is supported in a length

direction by a piezoelectric element when driven in a direction of height by the piezoelectric element(fig 16, 114, 116), wherein the plurality of elements are respectively provided with the piezoelectric element where the polarities of electric fields of which are alternately different from each other(col 12, line 60 through col 13, line 62). Regarding claim 27, Helsel et al. discloses the plurality of elements each having the reflecting surface are two dimensionally arrayed by juxtaposing long sides(fig 38A)

Regarding claim 2, Helsel et al. discloses wherein a plurality of said light modulation elements are respectively provided with the plurality of piezoelectric elements, and wherein the polarities of electric fields of the plurality of piezoelectric elements are alternately different from each other(col 12, line 60 through col 13, line 62).

Regarding claim 4, Helsel et al. discloses wherein a rear surface side of an effective reflecting portion(fig 16, 100) of each of the plurality of said light modulation elements is fixed to the piezoelectric elements(fig 16, 114, 116).

Regarding claim 6, Helsel et al. discloses when the reflecting surfaces are substantially flush with each other, the reflecting surfaces act as a flat mirror as a whole(fig 38, since the device has the same structure as the applicants device, this limitation is inherently met).

Regarding claim 10, Helsel et al. discloses a projection optical system for projecting an image together with the light modulation element (fig 6).

Regarding claim 11, Helsel et al. discloses wherein pixels each formed from the plurality of said light modulation element are arranged in a two-dimensional array(fig 38A) .

Regarding claim 15, Helsel et al. discloses a projection apparatus including an optical modulation element for modulating incident light in accordance with a video signal(fig 13, Vim).

Regarding claim 18, Helsel et al. discloses a projection apparatus including an optical modulation element for modulating incident light in accordance with a video signal(fig 13, Vim).

Regarding claim 26, Helsel et al. discloses a plurality of reflecting surfaces(fig 38A, col 12, lines 60-65); and means for controlling heights of the reflecting surfaces by using a plurality of piezoelectric elements(fig 16, 114, 116), wherein said means for controlling forms a diffractive grating in which the heights of the reflecting surfaces change periodically and forms a mirror in which the heights of the reflecting surfaces are substantially constant(col 13), and said means for controlling forms the diffractive grating by applying voltages to adjacent piezoelectric elements so that a polarity of electric field of the plurality of the piezoelectric elements may be varied between the adjacent piezoelectric elements(col 12, line 60 through col 13, line 62).

Regarding claim 27, Helsel et al. discloses the plurality of elements each having the reflecting surface are two dimensionally arrayed by juxtaposing long sides(fig 38A)

Regarding claim 28, Helsel et al. discloses wherein a plurality of said light modulation elements are respectively provided with the plurality of piezoelectric

elements, and wherein the polarities of electric fields of the plurality of piezoelectric elements are alternately different from each other(col 12, line 60 through col 13, line 62).

Regarding claim 29, Helsel et al. discloses wherein a rear surface side of an effective reflecting portion(fig 16, 100) of each of the plurality of said light modulation elements is fixed to the piezoelectric elements(fig 16, 114, 116).

Regarding claim 30, Helsel et al. discloses wherein a deformation amount of a projecting or recessed shape of each element is changed by adjusting a voltage to be impressed to the piezoelectric element, thereby controlling an intensity of reflected light(col 12, line 60 through col 13, line 62).

Regarding claim 31, Helsel et al. discloses when the reflecting surfaces are substantially flush with each other, the reflecting surfaces act as a flat mirror as a whole(fig 38, since the device has the same structure as the applicants device, this limitation is inherently met).

Regarding claim 34, Helsel et al. discloses wherein pixels each formed from the plurality of said light modulation element are arranged in a two-dimensional array(fig 38A) .

Regarding claim 35, Helsel et al. discloses a projection optical system for projecting an image together with the light modulation element (fig 6).

Claim Rejections - 35 USC § 102

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claim 5, 12, 19-21, 24 rejected under 35 U.S.C. 102(b) as being anticipated by Yokoyama et al.(U.S. Patent No. 6,585,379).

Regarding claims 5, Yokoyama et al. discloses an optical modulation element capable of forming a reflective diffraction grating in which heights of a plurality of elements each having a reflecting surface periodically change(fig 2), wherein the reflecting surface of at least one of the plurality of elements is supported in a length direction by a piezoelectric element(fig 2, 301) when driving the piezoelectric element, wherein a deformation amount of a projecting or recessed shape of each element is changed by adjusting a voltage to be impressed to the piezoelectric element, thereby controlling an intensity of reflected light(col 8, lines 12-35).

Regarding claim 12, Yokoyama et al. discloses wherein pixels each formed from the plurality of said light modulation element are arranged in a two-dimensional array(fig 6).

Regarding claim 19, Yokoyama et al. discloses the plurality of elements each having the reflecting surface are two dimensionally arrayed by juxtaposing long sides(fig 2, 306).

Regarding claim 20, Yokoyama et al. discloses wherein a rear surface side of an effective reflecting portion(fig 2, 306) of each of the plurality of said light modulation elements is fixed to the piezoelectric elements(fig 2, 301).

Regarding claim 21, Yokoyama et al. discloses when the reflecting surfaces are substantially flush with each other, the reflecting surfaces act as a flat mirror as a

whole(fig 2, 306, since the device has the same structure as the applicants device, this limitation is inherently met).

Regarding claim 24, Yokoyama et al. discloses wherein a plurality of said light modulation elements are respectively provided with the plurality of piezoelectric elements, and wherein the polarities of electric fields of the plurality of piezoelectric elements are alternately different from each other(col 6, since each pixel can be either convex or concave at any given time this limitation is inherently met).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claim 7, 32 is rejected under 35 U.S.C. 103(a) as being unpatentable over Helsel et al.(U.S. Patent No. 6,285,489) as applied to claim 1, 26 above.

Regarding claim 7, 32, Helsel et al. does not disclose wherein each of a plurality of said light modulation element is a strip-shaped element having a width of about 5um. However, forming the light modulation element as a strip-shaped element having a width of about 5um would have been an obvious mater of design choice, since such a modification would have involved a mere change in the size of a component. A change in size is generally recognized as being within the level of ordinary skill in the art. *In re Rose*, 105 USPQ 237 (CCPA 1955). Regarding the

Claims 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yokoyama et al.(U.S. Patent No. 6,585,379) as applied to claim 5 above.

Regarding claim 22, Yokoyama et al. does not disclose wherein each of a plurality of said light modulation element is a strip-shaped element having a width of about 5um. However, forming the light modulation element as a strip-shaped element having a width of about 5um would have been an obvious mater of design choice, since such a modification would have involved a mere change in the size of a component. A change in size is generally recognized as being within the level of ordinary skill in the art. *In re Rose*, 105 USPQ 237 (CCPA 1955). Regarding the

Claim 16, 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yokoyama et al.(U.S. Patent No. 6,585,379) as applied to claim 5 above and further in view of Helsel et al.(U.S. Patent No. 6,285,489).

Regarding claims 16, 23, Yokoyama et al. does not specifically disclose a video signal is used for driving the light modulator. However, Helsel et al. discloses a video signal is used for driving the light modulator(fig 13, Vim). It would have been obvious to one skilled in the art at the time of the invention to use a video signal for driving the light modulator as shown by Helsel et al., in the display of Yokoyama et al., since as shown by Helsel et al. video signals are commonly used for driving light modulators so as to produce a visual display for the observer.

Allowable Subject Matter

Claim 25 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. With the allowable feature being the deformation amount of a projecting or recessed shape of each element is changed by adjusting a voltage to be impressed to the piezoelectric element, thereby controlling an intensity of reflected light

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Timothy J. Thompson whose telephone number is (571) 272-2342. If the examiner can not be reached his supervisor, Georgia Epps, can be reached on (571) 272-2342.

T.J.T.

9/10/04

TIMOTHY THOMPSON
PRIMARY EXAMINER